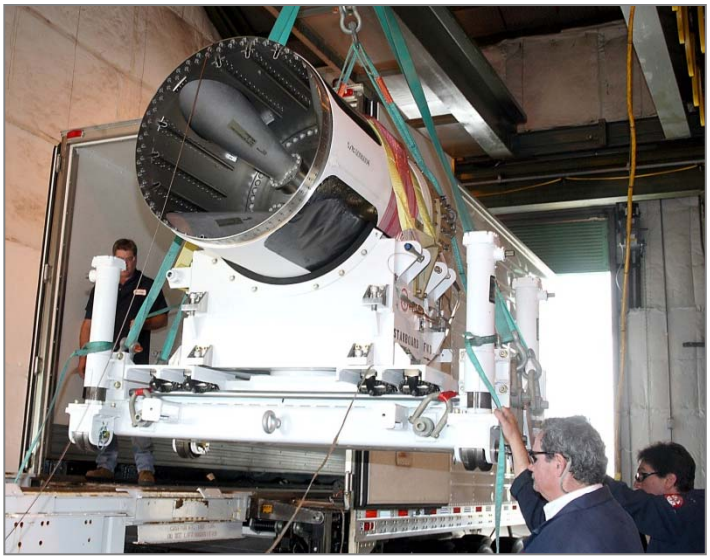
Orion Crew Exploration Vehicle Weekly Accomplishments

Week ending May 2, 2009

The Pad Abort 1 (PA1) Adapter Cone (Photo left) fit check to the PA1 crew module is complete. The adapter cone is scheduled for installation on May 12 in support of the acoustics test.

The Jettison Motor (Photo below) for PA1 (Launch Abort System 1 motor) shipped from Aerojet (Sacramento) to White Sands Missile Range, New Mexico.



The Michoud Assembly Facility (MAF) Universal Weld System 2 (Photo left) Ground Test Article (GTA) production continues. The second GTA weld is in work and lessons learned from the first weld are being used to support subsequent welds**.**

The first Orion cone panel to longeron weld was measured, recorded and charted for weld shrinkage. Shown at right, is the Ground Test Article Crew Module Cone Panel pin up adjustments.

The Primary Longeron Fitting –Upper Ring Frame (PLF-URF) test article was fitted to the strong back with welding of tabs completed. The article is currently at the Modern Machine and Tool Company facility for installation of sensors. The stainless steel load path fittings were sent out for heat treat. All hardware is on hand and in bonded stores. A safety review was conducted resulting in approval to conduct the test in the current facility.

The Honeywell command and data handling team began testing of the brassboard version of the Network Switch Card. This is the last brassboard hardware for the network. The High Integrity Network Interface Card and Standard Integrity Network Interface Card were received. Once all the boards have completed individual check-out, these components will be connected together for the first demonstration of Time Triggered Gigabit Ethernet on Orion-like hardware. The Network Switch Card Brassboard #1 is shown in photo right.

The static testing of a Peacekeeper SR118 motor was successfully conducted at the T-6 test facility of ATK – Promontory, Utah. This was the second SR118 static fire conducted by RSLP as part of their aging and surveillance program. Post test visual inspection of the motor did not reveal any anomalous conditions with the nozzle appearing to be in excellent condition. The motor (S/N 0000040) was 268.3 months (22.4 years) old at the time of test and had been conditioned to ~72 deg. prior to firing. The motor fired successfully at T-0 and performance, with one exception, was nominal through action time. The motor showed excellent ballistic performance with all discrete parameters being close to nominal values of the existing static fire database. The one area of concern is motor tail-off which was considerably longer than previously observed. The predicted motor tail-off was approximately 2.9 seconds compared to an actual of approximately 4.9 seconds. ATK and Northrop Grumman will continue to evaluate this as part of the post-test data review.

The new Pad Abort 1 drogue and pilot brackets (Photos below) for the confidence testing of the drogue and pilot mortars was received this week from Langley Research Center. The CEV Parachute Assembly System team is supporting procedures development and test integration in close coordination with the Engineering Directorate's Energy System Division. Details on test levels, instrumentation, and test facilities are in work.

The Attitude Control Motor (ACM) full-scale OAT-3 igniter was tested at the ATK Elkton facility. Video showed good igniter propellant grain ignition and flow through the 13 igniter nozzle ports. Post-test inspection showed the hardware to be in good condition with a significant amount of non-burning debris coming out of the nozzle ports. The ACM is required to reach 90% maximum thrust within 130 msec. ATK uses chamber pressure as the ignition integral rather than thrust. Quick look data shows OAT-3 did not meet the minimum pressure integral of 0.541 psia-sec at 10 msec. The data shows it took 45 msec just to reach sufficient igniter pressure to ignite the igniter motor's propellant grain. The OAT-3 test proved the igniter's propellant grain can be ignited if all of the BKNO3 pellets are not broken apart.

Communications and Public Outreach

Astronaut Ken Reightler shared his personal space flight experiences and discussed the Constellation Program with students at Orion Middle School and Orion High School in Orion, Illinois. The visit by the Orion/Lockheed Martin/Hamilton Sundstrand team was a result of the of inquiries to NASA by Rhonda Cox, an Orion High School teacher who is writing a non-fiction book for young adults about the Constellation Program.